

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2487.—Vol. LIII.

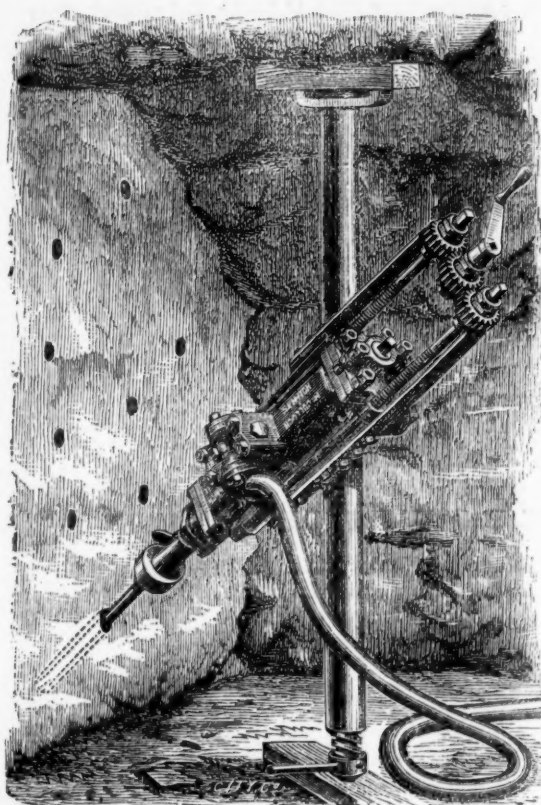
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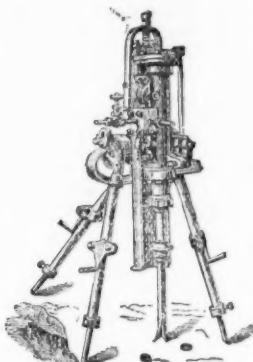
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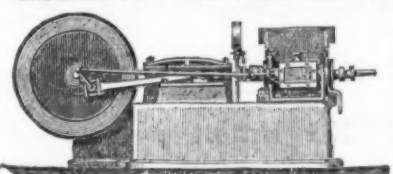
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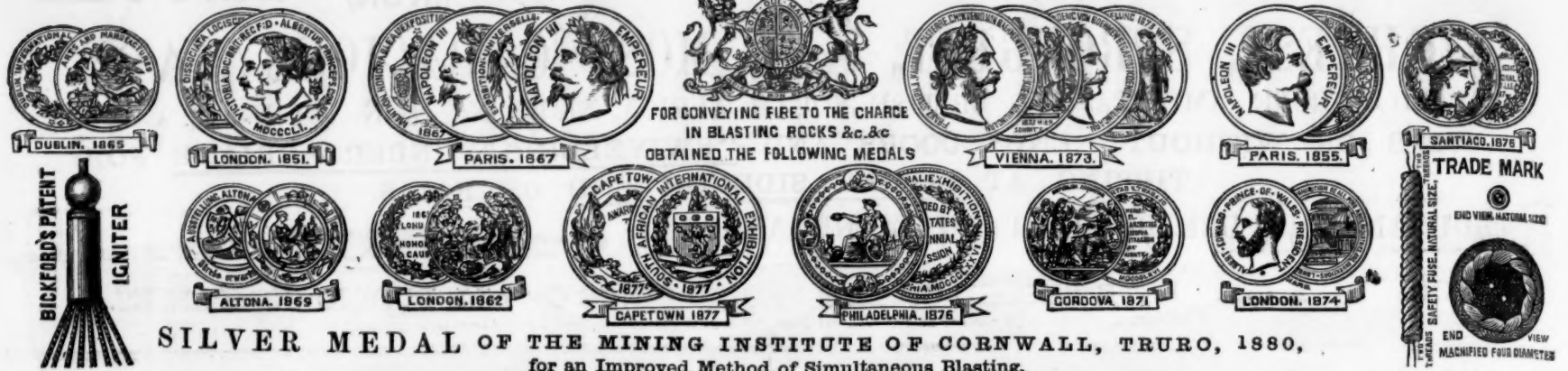
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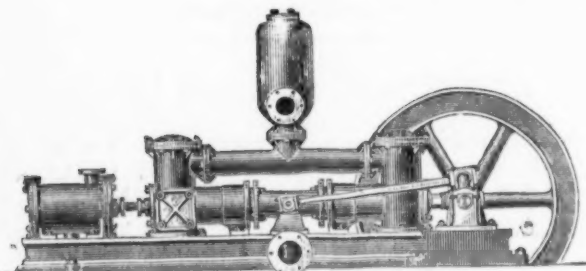
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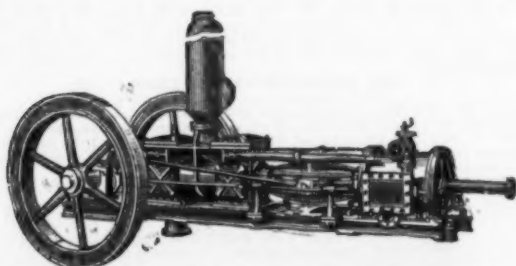
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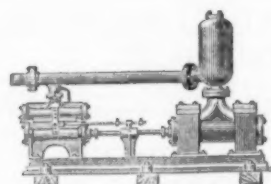
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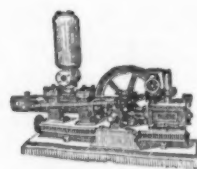
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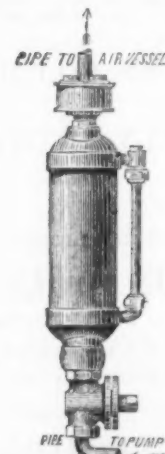
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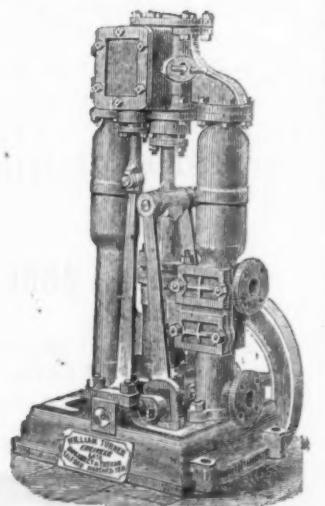
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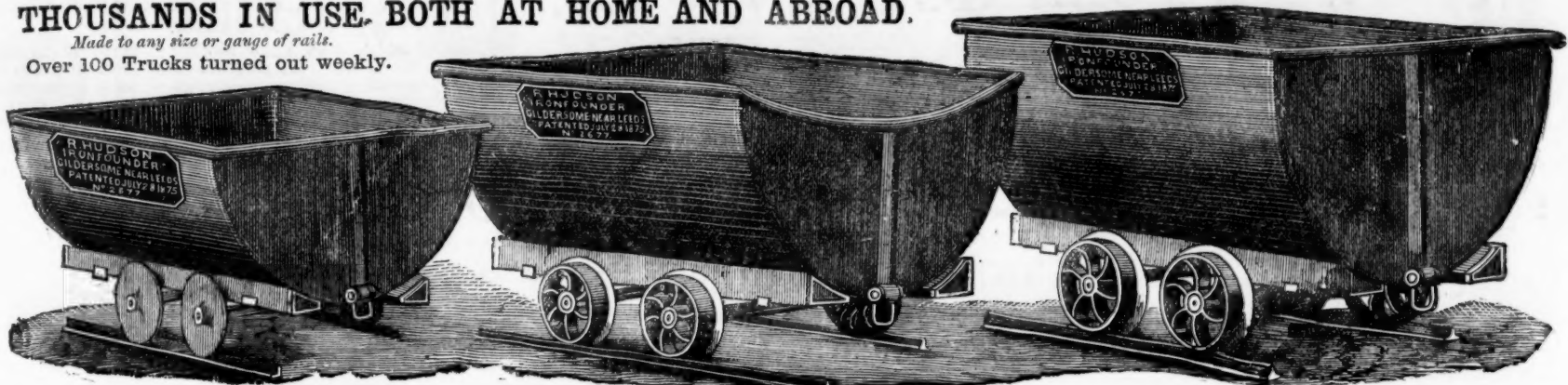
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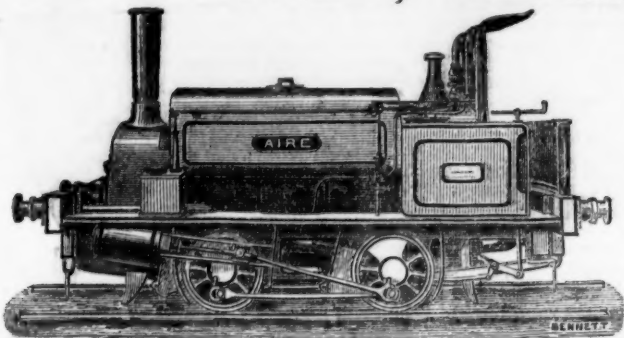
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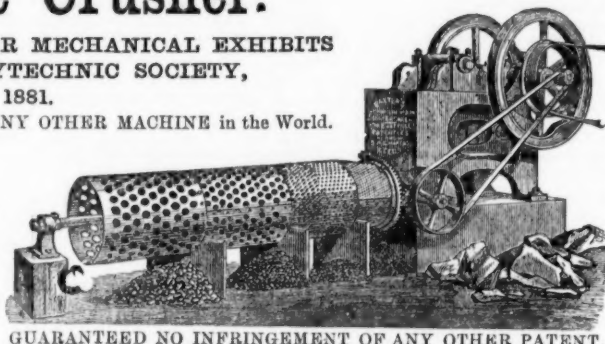
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THE COPPER MINES OF THE FAR NORTH—SOUTH AUSTRALIA.

SIR,—I subjoin an account of two important mines—the Blinman and the Mount Rose—the particulars of which I venture to think may be interesting to general readers as well as to those connected with the Corporation of South Australian Copper Mines, if you will do me the favour of inserting it in the *Mining Journal*. On my return in a few weeks I shall do myself the pleasure of calling upon you with some further particulars of mining out here.

The Blinman Mine is situated in the Flinders range of mountains some 800 ft. above the sea, 25 miles from a railway, and 330 miles from Adelaide. It, however, takes two days to travel this distance by railway, owing to the slow speed of the trains (15 miles an hour), and the long stoppages at each station to shunt or take up goods trucks—the goods and passenger traffic being conveyed by the same train. The mine is picturesquely situated on the top of a sandstone hill about 100 ft. above the Blinman Creek. The ore cropped up to the surface along the summit for 50 or 60 fms. in length in large irregular masses, there being no clearly defined lode near the surface. The mineral made between irregular walls of hard magnesian sandstone, from 6 to 20 ft. apart, running in a north and south direction with an inclination to the east. At surface the underlay is variable, but below the 40 fm. level the inclination to the east is regular, about 3 in 12. The dip of the strata at surface is not very distinctly marked, but it may be said to incline to the west at an angle of 60°.

The outcrop of ore may be seen on surface for some 500 ft. At the south end the ground is somewhat broken and changed in character, and has hitherto been unproductive of mineral. At the north end the strata is also somewhat disturbed by a cauter lode joining the main lode, but beyond the outcrop can be traced along the surface for a considerable distance as yet entirely unexplored. The matrix between the hard sandstone walls is a siliceous brown limestone, and iron traversed from east to west by broad veins of ore from 1 to 6 ft. wide with innumerable smaller strings of ore running between the veins in all directions. Sometimes these all run together causing thereby large solid deposits of rich ore. From the surface to the 40 fm. level the mineral consisted of rich oxide and carbonate ores. These ores were probably formed by metallic gases arising from a large deposit of yellow sulphuret ore beneath when in a state of fusion. These metallic vapours in ascending to the surface, through the fissure in the sandstone, coming in contact with substances having an affinity for copper, such as limestone, iron, &c., interchanged the gases and lead to the formation of the rich oxide and carbonate ores.

The whole of the matrix between the sandstone walls from 6 to 20 ft. wide being more or less impregnated with small strings of ore it became necessary to remove the whole mass. This has left immense underground quarries or caverns connected by narrow passages, and in some instances open to daylight 250 ft. above. The whole workings underground are unsupported by timber, the rock being sufficiently firm to stand without any artificial support. From the 40 fm. level downward a great change took place. The lode became more defined and regular, and the character and colour of the limestone matrix and ore altered, the former becoming softer and whiter, and the latter changing from blue and green carbonates to yellow sulphuret, making in branches from 6 in. to a width of 6 to 8 ft. in a few fathoms. One shoot of solid ore at the 50 fm. level was reported as being 7 ft. wide, and extending 17 ft. in length of 28 per cent. ore, worth at that time (1871) 280l. per cubic fathom. This fact taken in conjunction with the theory of the formation of the extensive deposits of carbonate ores above points to the conclusion that large and permanent deposits of sulphuret ore will be met with in depth, and that the real riches of the mine have only just been tapped on reaching the sulphuret ore. The lode in the 60 fm. level is worth 7 to 8 tons per fathom, and the level north 6 tons of 23 per cent. sulphuret ore, and in the 45 fm. level 3 tons of 21 per cent. per cubic fathom, the lode in each level being 15 ft. wide. With the exception of sinking a winze in the 35 fm. level and the main shaft these are the only points being worked at present until a further supply of water is obtained for dressing purposes, and the winding-engine now in course of erection is completed, so as to work two kibbles at the same time, one ascending full while the other is descending empty.

It is estimated the reserves of ore now laid open in the mine are sufficient to last for at least a year, giving an output from 200 tons and upwards of dressed ore per month. In addition to the above there is at surface about 10,000 tons of halvans of a low percentage left by the former company. As already stated, the lode being 15 to 20 ft. wide in places, and the whole more or less impregnated with small strings of ore the entire mass was taken away; but only the rich ores of 20 to 30 per cent. that could be easily separated by hand were selected, the other portions being put on one side with the intention at a later period that machinery should be used and water obtained to dress it up to 20 per cent. Self-acting dressing machinery has been erected, and is capable of crushing and dressing 80 tons of lodestuff in 16 hours so soon as sufficient water is obtained. The Blinman Mine is a singularly dry one, no water having been met with above the 50 fm. level, and from thence downward the supply is very meagre, not more than sufficient to keep the dressing machinery at work three days a week. The main shaft is being pushed down to the 70 fm. level with all speed, with a view of obtaining an additional supply of water on cutting the lode at that depth; in sinking a small spring of water was cut, but it only lasted a few weeks. The shaft being perpendicular is not being sunk on the lode, but the water oozing into it is highly charged with mineral and quite black from the oxide of copper coming from the lode. This augurs well for cutting a rich lode at the 70, which it is expected will be intersected six weeks hence. Should sufficient water not be met with on cutting the lode at the 70, of which there is every favourable prospect, borings will be made in the neighbourhood, and a dam constructed across the dry creek to conserve the rain water from whence it will be pumped up to the dressing-floors. With a sufficient supply of water and an output of only 200 to 250 tons of dressed ore per month the profits should be from 12,000l. to 15,000l. a year. Capt. Wm. T. Bryant has charge of the mine, and great credit is due to him for the way he is opening out its resources and the arrangement of the surface operations, especially his plan of economising the water and using it over and over again until it is fairly used up.

The Mount Rose Mine is situated much further north in the same range of hills as the Blinman, and distant some 50 miles from the railway. It was first discovered about 20 years ago, and was then considered the most promising mine in the North, and many tons of rich ore were raised. Owing to a severe drought that lasted for six years operations had to be relinquished as it was impossible to convey provisions and stores to the mine. On the late extension of the railway northward the Government granted a new lease for 99 years. On resuming operations a Robey portable engine was used to pump and wind; this has enabled the main shaft to be sunk 23 fms. from surface, but it will now have to be replaced by a permanent horizontal engine as it is becoming overpowered by the work it has

to do. The main shaft was fortunately commenced on the top of a chimney of very rich hard carbonate ore embedded in soft black oxide of copper. This has extended from the surface downward, and is increasing in size as depth is attained. Some of the ore has assayed over 60 per cent., and many tons have been sold at 49 per cent. without dressing—half pure metal. At the bottom of the shaft in cutting a plat 10 by 12 ft. 7000 lb. of ore was taken out, and in driving levels at that depth rich deposits of similar ore yielding 7 and 5 tons to the fathom have been driven through. The mine possesses all the characteristics of the Burra Mine, there being no defined lode at surface owing to the ground being somewhat unsettled, but in depth the ore is increasing in size and richness. A notable feature is the large quantity of mundic at the bottom of the mine probably as much as 10 tons to the fathom, and as it is said in Cornwall "mundic never rides a bad horse" it is thought that this mundic will change into sulphuretted ore in depth, and that when it does the mine is likely to be one of the largest as it is certainly the richest ore-bearing in the colony. During the last six months ore to the gross value of nearly 50000 lb. has been raised. The mine is working at a profit which it is expected will be considerably augmented as depth is obtained. T. A. MASEY.

Adelaide, March 10.

THE INDIAN GOLD MINES, AND THEIR PROSPECTS.

SIR,—We subjoin an extract from the Madras Mail of March 24, with reference to the prospects of the Balaghat Gold Mining Company, situated in the Kolar district of Mysore, which, if you can find space for it in your Journal as an item of mining intelligence, we doubt not will have considerable interest for the shareholders in the numerous other companies whose properties are situated in the same district.—Madras, March 28. ARBUTHNOT AND CO.

We are glad, says the authority mentioned, to see that the prospects of the Balaghat Gold Mining Company are decidedly improving. In January last Capt. Bray reached the bottom of the old workings at 118 ft. from the surface in No. 5 shaft, striking a well-defined quartz reef 3 ft. 6 in. wide, with gold visible in the stone, which he valued at about 1 oz. of gold to the ton of stone. Since then the depth of the winze has been increased to 141 ft. from the surface, the reef still holding down, with gold visible in all the stone broken from it, which is reported by Capt. Bray to be looking splendid, especially at the north end. Mr. St. Stephens, M.E., who visited the mine, values the stone at this depth at from 4 to 6 ozs per ton, and considers the prospects most encouraging. Out of a shovelfull of this stone roughly crushed Capt. Bray washed 1½ dwt. of gold. Instructions have been forward to the manager to commence crushing without delay, and two additional Australian miners have been added to the staff. By the latest reports 31 tons of stone, showing visible gold, were at bank, and if the reef from which it has been obtained continues to hold down the property must be a very valuable one. The financial success of this company would have the effect of stimulating mining enterprise in the Kolar district to a very large extent, as it is conjectured that their good fortune has been arrived at mainly by their having succeeded in sinking to a greater depth than any other company on these gold fields has yet attained to, the shaft on the auriferous vein in the Balaghat Mine, owing to the conformation of the ground, being about 70 ft. lower than the Munday shaft, Ooregum, which is the next deepest shaft in the district as regards sea level.

THE INDIAN GOLD MINES, AND THEIR PROSPECTS.

SIR,—The subjoined extract from the Madras Mail will show what may be expected when mining has been carried on to below the old native workings:—

COLAR GOLD FIELDS.—For some weeks past there have been rumours of a discovery of rich quartz in the Balaghat Mines, in the Colar fields, and the shares of this company have suddenly risen from an almost nominal price to above par. A gentleman who has recently visited the mine, and went down the shaft, which is now about 140 ft. below the surface, confirms the statement as to the find and richness of the reef which has been struck below the old native workings, and is now about 4 ft. in thickness and running in a northern direction. About 40 tons of this quartz have already been brought to the surface, but, owing to the smallness of the shaft and the presence of water, not more than a ton a day is now being raised. Our informant states that the stone already on the bank is of marvellous richness, nearly every piece of stone showing traces of gold, and those pieces which were roughly tested in a mortar yielded at the rate of from 40 to 50 ozs. per ton. One piece of stone, weighing 6 ozs., and showing but few traces of gold outside, yielded nearly 3 dwts. of pure gold. The Balaghat Company's machinery is now being got ready, so that crushing may be commenced as early as possible. The Ooregum Company has, we hear, also bottomed the old native workings at about the same depth, and for the last three weeks have been crushing stone brought up from what is known as Munday's shaft. This stone is also of a rich character, and promises satisfactory results.

I may venture to say that no mine in India has yet been carried to a sufficient depth to really test the reefs, which bear such evident signs of having been remunerative to the old native workers. HOPE.

Here's Hill, April 18.

INDIAN GOLD MINES—THEIR EXTRAVAGANT MANAGEMENT.

SIR,—I sincerely wish that every shareholder in every Indian gold mine could read the letter from an "Australian Gold Mine Director" and the article on gold mine management by Mr. Thomas Cornish, both of which appeared in last week's *Mining Journal*. It is time that a stop was put to the dreadful extravagance of the Indian undertakings. We have on the boards of the Indian gold mine companies a lot of army officers and others who are utterly innocent of the life-long business training which is necessary to make economical and capable administrators, and who are making a nice thing out of the concerns in the way of fees. This nice thing they are, of course, very wishful to keep, as long as there is a penny left in the coffers, for the double purpose of getting all they can, and of redeeming their own investment without loss, always supposing that that investment was made in hard cash, which, in view of the recent revelations, is in some instances I fancy very doubtful. If I mistake not the promoters of these undertakings had, in some cases, a nice way of making things pleasant all round, which would obviate the necessity for hard cash being paid for shares. We do not hear of directors offering (except in one instance I believe) to defer receiving their fees until the undertakings can pay them out of revenue instead of out of capital, and in the exception to which I refer the directors have stopped their own fees for the very good reason that they have got to the bottom of their treasure-chest. Not much credit in that case, I think. It is only a few months since that the systematic extravagance in the management of the Indian gold mines was pointed out in the *Mining Journal*, and I would very much like to see a return to the charge so that some united effort may be made to put a stop to this objectionable policy. Let us shareholders see our directors place their fees to a suspense account, and cut down expenditure all round most severely, and then we may begin to think that they have the interests of all at heart and not of self only. I append a statement of expenditure of some of the companies:—

Name of Company.	Expenditure in England.	Expenditure in India.	Report for Year Ending
Indian Glenrock	£10,425	£53,471	March, 1882
Devala-Moyar	1,722	25,468	Dec., 1882
Indian Phoenix	2,969	19,926	Dec., 1881
Devalah Central	1,146	14,985	Dec., 1881
Wynad Perseverance	1,823	13,932	May, 1882
Rhodes Reef	1,847	12,529	Dec., 1881
Cootacovil	938	12,611	June, 1882
Wentworth	2,237	10,316	Sept., 1882
Indian Trevelyan	2,124	9,890	Dec., 1881
Tambracherry	1,750	5,920	April, 1882
Indian Consolidated	2,300	3,569	Dec., 1881
	£29,281	£182,617	

Thus about half of the accounts only come up to December, 1881, so that it may be imagined what the totals would be if brought up to the present time. It would be very interesting to know how it is that some companies spend so much more than others on their London establishments. Your Australian correspondent, to whom I referred at the beginning of my letter, says that with them economy is reduced to a science. Can nothing be done to induce or coerce our directors to study the elementary problems of that science so

that the waste of our money may be prevented, or failing that to turn them out and get better men. The present mismanagement can only end in disaster.—York, April 17. J. M.

MINING ON THE GOLD COAST.

SIR,—I am a discontented shareholder, but not for the reason assigned by "R." I am discontented because there is not so far as I can see an atom of unbiased evidence to show the existence of the thing for which the directors of the Guinea Coast Company paid 43,000 lb. in cash. "R." says he prefers to believe Capt. Burton and Messrs. Walker and Dahse rather than my "assertions." I was foolish enough to think that I had adduced cogent reasons to support what is certainly my belief, and evidently the belief of buyers of mine shares, for our shares are simply unsaleable. However, let that pass. If "R." will carefully read again Capt. Burton's report (after examining the property) he will see that Capt. Burton does not say one word about the rich reef which the prospectus speaks of. If he found it why did he conceal the fact? If he did not find it what has become of it? As to Messrs. Walker and Dahse, the former was avowedly the vendor's agent, and the latter was employed and paid by him. So far as appears our directors when they paid the 43,000 lb. had not taken any trouble whatever to verify the vendor's statements, but they accepted these statements as confidently as if they had no knowledge of the ways of the world, and as if there were no such people as sharp-practice promoters.

What would be thought of a private individual who acted in this way even in a small matter involving only a few score pounds, and our directors were dealing with scores of thousands of pounds. It is I think the bounden duty of directors in any and every case to ascertain by independent evidence the truth of a vendor's statements. In this particular case they were doubly bound to do so, because two of them were members of a syndicate which reaped a large harvest by the sale of the alleged rich reef to this company. These two gentlemen, in fact, stood in the anomalous position of being at once vendors and purchasers. That fact alone we think should have made them specially careful and scrupulous, so as to leave no room for a shadow of suspicion with regard to this purchase. By this time they no doubt regret that they were not more careful, but regrets will not replace the shareholders' money. I am glad that "R." thinks it the duty of the directors to give without a moment's delay precise and definite information on the vital point, reef or no reef, and he will observe that since the general meeting the directors have remained absolutely dumb, and have made no effort whatever to allay what is evidently—whether ill or well founded—a panic. Can any shareholder in his senses believe that any directors would under such circumstances refuse to say what would restore confidence if they could do so truthfully? GUINEA COAST.

St. Leonards-on-Sea, April 16.

AKANKOO MINING COMPANY.

SIR,—In the *Mining Journal* of April 7 "Patience" states that three further rich veins have been discovered in the Akankoo property. There has been no confirmation of this by the directors up to the present, although we were promised that all news should be immediately published in the *Journal*; but there are indications of favourable news having been received. It is, and always has been, incomprehensible to me why directors of mining companies do not more readily avail themselves of the easy mode of communicating with their shareholders which you, through your columns, so readily afford them. We are, however, uninitiated in the mysteries of the board-room, and must be content to accept information about our own properties from sources outside the "inner circle."

It is not time that we heard of the arrival at the mine of the manager, Mr. Lane, and the machinery; and it would be acceptable news, indeed, to hear something definite of the progress of the tunnel, so that we could form some slight idea of the time we shall yet have to wait before we may expect a telegram with the result of the first crushings of those many tons of ore of which Mr. Lane spoke, from which he himself, by crushing and washing in small quantities, had obtained returns of from 10 ozs. to 60 ozs. of gold per ton? Although the information from head-quarters is, as I have said, scanty, still all independent reports seem to agree that the work at the mine is being pushed on vigorously at last, and we cannot be too thankful for this. Others like myself interested in the Gold Coast would, I am sure, be glad to see further "Jottings from the Gold Coast" from your correspondent, who evidently thoroughly knows the country and the subject on which he is writing. EXPECTANS.

AKANKOO (GOLD COAST) MINING COMPANY.

SIR,—I should like to suggest to the directors of this company that they carry out Mr. Gething's advice given at the general meeting—to furnish the shareholders regular reports of the progress at the mine in the *Mining Journal*. Although work has been proceeding for over 12 months now, we have had very few and meagre reports. I feel confident from the many testimonies of the richness of Akankoo reefs that we have a very valuable property, and if the directors will publish more fully and frequently accounts of development the value would be more generally recognised. Manchester, April 17. J. C.

MINERAL WEALTH OF VENEZUELAN GUAYANA.—NO. II. THE CARATAL GOLD FIELD.

West of the La Union and immediately south of the Los Frailes Mine is the Sosa-y-Mendez Concession, owned by the Callao Bis Company. This important grant contains several large quartz veins, but they have not yet been extensively developed. An opening which was made on one of them near the Los Frailes boundary produced some excellent quartz, which on being put through the mill yielded good results. This concession is of sufficient extent to be worked by an independent company, and it is surprising that the owners continue to allow it to remain undeveloped, seeing how good the prospects are.

THE PANAMA MINE.—To the west of the Los Frailes property is the Panama Mine, which is situated on an extensive concession. The property has recently been acquired by a group of English capitalists, and is now being worked privately. Large quantities of gold have been extracted by the natives from the outcrop of the lode without the aid of machinery. The mine has been opened on a well-defined fissure vein of considerable thickness, and, from its direction and underlie, I believe to be the Los Frailes vein. I have traced its outcrop for more than a mile in length. A mill of 30 stamps has been erected close to the main shaft, and the quartz from the vein at the back of the lode has produced in the mill from 1½ to 2 ozs. of gold per ton throughout a distance of nearly 500 ft. The greatest difficulty this company will have to contend with is the want of water, which has to be brought a distance of nearly 2½ miles through a very rough country and over lofty ridges, which will necessitate considerable power to keep up a sufficient supply for the works. It is satisfactory, however, to note that the operations are now placed under the direction of an efficient mining engineer, who will doubtless, in a short time, overcome all difficulties, and bring the mine into a profitable state.

POTOSI MINE.—The concessions owned by this company are probably the most extensive of any held by one company in the Caratal district. The company, with careful management, and a sufficient amount of working capital, will again in time assume an important position, but its commencement was certainly unfortunate. They held a small portion of the Chile vein, from which unusually rich quartz was obtained; this is now worked out, and the company will in future have to look to the development of the Peru lode and other discoveries for opening up a new mine before the shareholders can derive any benefit from their investment. At present the operations are chiefly limited to the opening out of the Peru lode, where a new 60-stamp mill is erected. This vein is from 4 to 5 ft. in thickness, and, like all the lodes in the Caratal district, improves in character in depth.

The scant supply of water to be obtained in the neighbourhood of this mine will, I fear, be a source of anxiety to the management, un-

less this company should combine with the Panama in dividing the expense of obtaining an abundant supply from the River Yuruari, in which case their operations will be free from interruption in this respect. There are several other lodes in the Potosi property, which have been more or less developed, and in some instances rich quartz has been abstracted. I expect to see both Panama and Potosi in full operation in the course of a few months, and with a 60-stamp mill at each mine, the returns of gold from the Caratal district will doubtless be very considerably increased, as I consider that each of these mines is capable of returning from 4000 to 5000 ozs. of gold per month.—Sourrier, April 18. GOLD MINER.

MINING IN CHILI—ORIGIN OF DEPOSITS.

SIR,—Being largely interested in mining matters I shall probably be able from time to time to send you some interesting data as a constant correspondent. I should recommend you to have one. In the meantime, I may say that Chili is essentially a mining country, abounding in copper, silver, gold, nickel, cobalt, lead, nitrate and borate of lime, coals, &c. I have been surprised that so little attention has been devoted to mining enterprises. Very little foreign capital is employed, when as capital in the country is scarce a splendid return for investment is easily obtained in bona fide enterprises.

I have been engaged some years in solving the geological problem of the origin of deposits of silver. A year ago I had arrived at 600 metres depth in one of the silver mines, but an accident prevented our continuing work until lately. We intend advancing further, and the result shall be communicated to you by an early steamer. I will send you drawings of the works with the geological formation. I have sent the same also to the Freiberg University with a collection of stones showing the different strata. At the 600 metre level silver has been found recently; particulars of these discoveries shall also be sent. I am desirous of giving sufficient information, so as to open a discussion in the *Journal* as to the probabilities of a favourable exit.—Valparaiso, March 6. J. S. J.

BRAZILIAN GOLD MINES.

SIR,—From bad to worse! The average yield of gold of these mines for the months of September, October, November, and December—during which four months I was at the mines—was 33-681 grs to the ton of stuff. Scanty as this yield was, it was better than what follows. For January, 1883, the average yield was about 31 grs., but for February only 16 grs., or the 30th part of an ounce. This explains why I did not report the mines as being rich. They will soon, however, finish their own tale, and tell you who is right.

London, April 19.

JOHN L. AN.

NARROW-GAUGE RAILWAYS—THE DENVER AND RIO GRANDE.

SIR,—Having been consulted by several friends in this city since my arrival from Colorado concerning the prospects of the Denver and Rio Grande Railway, and thinking that a few facts bearing upon the subject may probably be of interest to the readers of the *Mining Journal*, I will, with your permission, give a brief history of the road, showing its rapid progress during the past few years. To those who have watched its varied career, since the first rail was laid, a little more than ten years ago, its history has been one of special interest. It was in 1871 that the first engine built for this road left the Baldwin locomotive works of Philadelphia, and this being the first experiment of building narrow-gauge roads in place of the ordinary standard gauge, it was thought advisable to use an engine of light weight, not exceeding 8½ tons. But what a change has been brought about by practical experience! Instead of the light engine of that time, those now in use on this road are from 35 to 40 tons, fully as heavy as those used on the broader gauge roads. Although the building of this road was to a certain extent an experiment at the outset, hopeful though the promoters were of the results, they nevertheless could not anticipate at that time the wonderful prosperity which the road has since achieved. In 1873 the Denver and Rio Grande ran from Denver to Pueblo, a distance of 115 miles, and it was quite a novelty to those who went to Colorado in search of health to ride on what they facetiously called the "baby railway." From that time forward little was done to extend this road further than Canyon City westward for a short distance, and Alamosa in a south-westerly direction, across the Sangre de Christo range of mountains, until the wonderful discovery of carbonate ores in Leadville during the summer of 1877. But before that time the road had fallen into the hands of Atchison, Topeka, and Santa Fe Company, one of the great trunk roads of the west, who commenced extending the line from Canyon City—the terminus of its western division—to the carbonate camp, a distance of 120 miles. Later on, however, after much litigation, the road was again controlled by the Rio Grande Company, and since that time they have been constructing branches in every direction that are likely to prove of profit to its projectors, until it now owns over 1200 miles of road, three-fourths of which have been added during the past few years. That this road will eventually become a most profitable concern does not admit of a doubt, as the wonderful discoveries of the precious metals, and the inexhaustible resources of coal and iron in the State of Colorado will fully testify, all points of importance now being reached thereby, and wherever the developments of further discoveries will warrant such an undertaking, the road will follow, and make the work of the miner profitable as well as add to the returns of the road. Until the end of the past month the Denver and Rio Grande could not lay claim to anything greater than local prominence, but at the time of writing the last rail has been laid connecting Utah with Colorado, adding another link to the ties that bind the East to the West, and in another month travellers may reach the Pacific slope over a new trunk line, affording a wealth of beauty along its course, through the very heart of the American continent, such as can be seen on no other road in that country, if, indeed, in any other portion of the world; and for this reason it will become popular with the travelling public, who can also break their journey at Salt Lake, the great Mormon city, en route without change of cars or making a special trip for the purpose, as is now the case by taking the Union Pacific. That the Rio Grande will get a large share of transcontinental business—both freight and passenger—is beyond question, as the bulk of the business now being done by the Chicago, Burlington, and Quincy to Omaha, the Eastern terminus of the Union Pacific, will be hauled to Denver, 600 miles further on the Burlington, thence beyond over the Denver and Rio Grande. Some may think it premature, perhaps, to say that this road will shortly become one of the great trunk lines of the country; but now it has been completed to Utah and connected with the Central Pacific, as it will be on May 1, it is no exaggeration to state that, in addition to its greatly increasing local business—averaging at the present time \$600,000 a month—the through traffic to the Pacific coast and return will eventually make the Denver and Rio Grande Railway one of the most profitable railway enterprises on the American continent. J. FITZGERD.

London, April 16.

P.S.—Information has just been received from Colorado that the first through train from Denver to Salt Lake carried 185 passengers—a fact which strongly confirms the predictions already made concerning the prosperous future of this road.

PYRENEAN COPPER AND IRON MINES.

SIR,—During the last fortnight Mr. Edmund Spargo has been in specting mines in the Basses Pyrenees, and amongst them the Changoa, which has for a considerable period yielded some of the richest argentiferous copper ores sent to the Swansea market, some of the parcels realising about 40 lb. per ton. Efforts are now being made to develop these mines upon scientific principles entirely unknown to the mines of the Pyrenees. The existing workings, and the improved character, regularity, and increasing size of the lode, combined with the proximity (hitherto unnoticed by the natives) of several important junctions with other large copper pyrites lodes, all tend to demonstrate that these mines are only in their infancy, all the workings clearly indicating that their further extension, both vertically and longitudinally, will lead to far more extensive and

probably richer deposits of argentiferous copper ore than have yet been developed. In a comparatively short time the yield and riches of the Pyrenean mines, now that British capitalists are beginning to realise their importance, will be definitely ascertained.

Liverpool, April 18.

OBSERVER.

ROCK-BORING MACHINES—COMPETITIVE TRIALS.

SIR,—I notice in the *Mining Journal* the explanation Messrs. MacKean and Co. give for believing that their machine is superior to any other—1. That in many tests their machine has bored faster with a given area of piston and a given pressure than any other. As they do not give any names of machines with which they were in contest that must go for what it is worth. 2. That their machine will work with $\frac{1}{2}$ atmosphere of pressure, and that with $\frac{1}{2}$ atmospheres it will make 1200 strokes per minute, and bore 13 inches of $\frac{1}{4}$ -inch hole per minute in Scotch granite with a 4-inch piston.

In answer to that I beg to inform Messrs. MacKean and Co. that I have seen a modern machine bore more than that amount of ground per minute in Cornish granite with half the destructive piston rate, and about 2 atmospheres less pressure. 3. That their machines have remained underground in boring granite for a month without breakage. If Messrs. MacKean and Co. will be good enough to pay the Cornish mines a visit they will find machines working underground boring in tin capel (about one of the hardest stones in existence), and it is nothing for a machine to stay at its work for two or three months without any breakage. It is very evident that Messrs. MacKean and Co. are ignorant of the rapid strides made in rock-boring machinery the last few years, and I believe when the contest comes off that instead of boring double the length of holes they will find themselves a long way behind some of the modern machines.

Madrid, April 14.

J. McCULLOCH.

ROCK-DRILLS—OBSTINACY OF UNSUCCESSFUL MAKERS.

SIR,—I observe endeavours are being made to bring about a trial of rock-drills for the purpose of deciding the respective merits of each, and as one interested in such trial I would offer to the different makers the following suggestion—That two or three capable and well-known mining engineers be asked to act as a committee to superintend and judge these trials, and to publish their award in the *Mining Journal*. This would settle a vexed question as to whose make was really the best. My experience of a former trial at which I assisted was that the losers made some paltry excuse for being beaten, and they continue to pose before the public as the makers of the very best drills. Now, if my suggestion were adopted, the award of the committee would be final and convincing.

Marbella, Spain, April 12.

W. MICHELL VIVIAN.

LONDON COAL SUPPLY.

SIR,—My un-intermittent attendance this month in the committee-room of the Alloa, Dunfermline, &c., Bill, combining personal communication with the leading promoting and opposing parties, induces me to submit the following remarks:—It may be deemed supererogatory to dilate upon the well-known immense advantage possessed by steamers of the largest cargo capacity in the coal trade, especially to London, where the import last year, according to official returns, amounted to 10,380,775 tons, the largest transport in the world, which will be greatly augmented with a reduction in price to the consumer. For want of water at the highest spring-tides the class of steam conveyance with which this undertaking is proposed to be inaugurated cannot, as an absolute, indisputable fact, supported by official data, be carried on from the Tyne or any north-eastern port, or from Grimsby or Hull, where the actual land lead, per official returns, ranges from 41 to 58 miles, the greater part the extreme distance. The Forth is the only river from which such can be effected, as, according to the most recent Admiralty chart, there is at St. Margaret Hope, above Queensferry, 17 to 31 fms. at low water, and below Queensferry 36 fms. and upwards. Having under the cholera visitation performed quarantine, as passenger from Northern Europe, at St. Margaret Hope during six long weeks, I can vouch for the sheltered position for transhipment of coal from barges, which will load in what was termed by a prominent witness as mud holes, inaccessible only to barges and small sailing vessels, thoroughly closed to steamers of the lightest draught.

The innumerable almost deserted creeks in the Forth will be utilised, a dock being a great hindrance in this trade—*vide* evidence in the Thames Traffic Bill. Although traction engines do not enter into competition with rail transit for such distances, as from the Midland coal field to London they effect the collection and haulage for short distances at much under railways, the lead on the Forth being immeasurably shorter than elsewhere without exception. The great difficulty in obtaining wagons from the railway company formed a very important point of the evidence in this Bill, as being a great obstruction to the development of the Forth coal traffic, which, in a great degree, is conveyed by carts. The oldest manufacturing firm of traction engines in Great Britain have examined my calculations and given me a certificate as to their accuracy, and the adaptability of traction engines to a large continuous coal conveyance. Royalty and coalowners will be thus made independent of any railway company. As the leading coalowners, with access to the Forth, have informed me, their coal trade was never in so depressed a state as at present, it will be of deep interest to them to learn that, based upon a delivery price into consumers' premises in London of 15s. a ton, with 8s. a ton at the pitmouth, by no means alongside ship, a dividend on paid-up capital of proposed company will accrue of 59 per cent., upon 7s. a ton 93 per cent., and upon 6s. a ton 126 per cent. The whole increased output of the entire Forth coal field will be contracted for—house, steam, and small coal, so that there is no doubt of a brilliant future for a coal field which, through its position on the only river in Great Britain capable of the largest steamers afloat loading cannot be competed with by any other district in the supply of the London market. My varied credentials are of the highest character, showing that the results I arrive at are deserving of implicit confidence, and which I am prepared to verify with the most minute practical details.

W. J. THOMPSON.

Little Toner-street, April 17.

MINING AND QUARRYING IN IRELAND.

SIR,—It should be remembered that mines are generally found in wild barren mountainous districts, the reclamation of which would be a positive national advantage. How full is Ireland of such situations, and of such premises? The sales of her copper ore used to bring fully twice the value of the average ores of Great Britain, the high prices commanded for her silver-lead and blende ores are evidences of their superior richness, the granites of Ireland are unsurpassed for excellence, durability, or colour for architectural or any other purpose to which granite is applied; they have in most instances the very great advantage of being more easily procured, and of cheaper transit than almost any granite known in the markets of the three kingdoms; her marbles are matchless for variety, figure, and colour, take a magnificent polish, and are admirably adapted for interior decoration and ornamentation. Water-power for sawing the stone into form is in close proximity to most of the quarries. Slates of excellent quality abound, although very few are wrought even for home consumption; if the quarries were prosecuted to their legitimate extent large indeed would become the export. At the Brow Head, near Crookhaven, flooring and paving flags of any size up to 12 ft. by 12 ft. of almost any thickness may be obtained; they are perfectly flat, of hard and durable texture, and of easy access—the refuse or waste would fall into the Atlantic Ocean, thus saving the cost of surface damages which are often enormous. At this place there are also capital roofing slates of fine colour, sound metal, and of large sizes, and yet these truly valuable quarries remain almost intact. If such opportunities presented themselves in Wales, Westmoreland, or Cornwall great and keen would be the competition for their possession. Rich mines of silver-lead have been wrought in the counties of Down and Monaghan, where noble veins of the rather rare mineral antimony have been met with, but like most of the other valuable mines of Ireland have been abandoned before they are half developed, whilst other countries are enjoying the prosperity from their mining industries, and are using every endeavour to

forward their further development. It is to be hoped that Ireland will not be much longer neglected, as it appears that justice and reason has once more resumed its sway. Happiness, influence, and prosperity will inevitably follow. Ireland will be as of old—"Great, glorious, and free; first flower of the earth, and first gem of the sea." Eastwood, April 18.

T. H. PENROSE.

RESTORATION OF MINERAL RIGHTS TO THE CROWN, AND DOLCOATH LEASE.

SIR,—I inferred from meetings at Dolcoath and other mines that the Cornish mining speculator had come to the conclusion of "rest and be thankful" with the present unsatisfactory state of the mineral laws. However, I find from the recent meetings at the Mining Institute of Cornwall and the Redruth Institution that they are at last awakening out of their deep sleep to a knowledge of the fact that the Legislature must solve this painful question. Seldom the Legislature takes action in a cause of this kind unless solicited to do so. I would, therefore, suggest that a general meeting be convened at the most convenient place, not for the county of Cornwall alone; but let representatives attend from every county in the United Kingdom where mining is prosecuted. Let there be prompt and united action in bringing the matter in a proper form before Parliament, and, if necessary, let miners make it a political question. In face of the present state of affairs, what is of more vital importance to mining, unless we callously stand by and witness the staple industry of Cornwall crushed out by the very people who reap the greatest benefit therefrom, without anxiety or risk—an industry which has perpetuated the name of Cornwall through history, from the days of the Phoenicians, and will do so through all ages, and has given the Cornish miner a predominance over all others throughout the known world. There are many mines now idle which, if the money unreasonably paid by them in dues, had been spent in further developing the mines, would at this day be in a profitable position. But, alas! the grasping and avaricious spirit of the lords prevents them from seeing the vast amount of injury they are doing to themselves, and the injustice to the adventurers.

It is appalling the amount of money being paid in calls and dues at this present time by very many of our mines from which the adventurer has not yet received a penny profit. Yet dues must be paid, yea, even to "the last drop of blood," and it is possible that such a glaring wrong is for ever to be tamely submitted to. I should think the adventurer far below a human being if such really was the case. Even a harmless worm will writhe when you put your foot on it. Place it in unmistakable characters to the lords that we as miners intend to throw off the heavy yoke they have hitherto compelled us, against our grain, to bear, and which is nothing less than a tyranny. Let it be seen that the spirit of Cornishmen still rebels against an unjust action as in days of yore—Trelawny's time. It is the bounden duty of Capt. Teague, Josiah Thomas, and Rich—men of influence and authority in the mining world—to keep to the front and secure the rights of miners from further aggression. If the English miner is to keep his stand in the world he must be dealt with on equitable terms as miners of other countries. Foreign competition through one-sided free trade—that bugbear some are yet ashamed to confess is such—is quite sufficient, and even more, for the English miner to be handicapped with. In the matter of Dolcoath lease, Mr. Bolden's appearance on the scene at the last meeting was clearly a case of "bearding the lion in his den." Of course "he was not there to stifle discussion" until he broached such a monstrous idea, who could think such an action possible in so unique a specimen of the mammalia. I should presume he was there with Mr. Pearce to "pour oil on the troubled waters;" it yet remains to be seen the effect of such an experiment. When Mr. Bolden sees the power he is now so unmercifully wielding over the adventurers flitting from his grasp he may think it would have been the wiser course to have let well alone, and even repent his action in a matter which, if it was possible, has lowered himself in the estimation of the mining public. Were it not for the grave nature of the case, it was laughable to hear the reason he gave for coming to the meeting, which appears from his own statement, "to make clear certain matters."

I think his remarks a waste of breath, and his presence an insult to the adventurers. Matters are only too clear. He demands from Mr. Basset a fine of 25,000*l.* for the renewal of the lease—no matter how it is raised, by foregoing dividends, call or a loan; 25,000*l.* has to be paid out of the adventurers' pockets. Mr. Marriott's letter to the Chairman is the creation of an ambitious mind. His iron hand can be traced throughout each line of that memorable document, and I sincerely trust the subject upon which it treats "is absolutely unique in all its circumstances," and that mine adventurers may never see its like again. In perusing the different methods submitted to the adventurers for raising the extortionate demand of Mr. Basset I would advise them to get as long a period as possible over which to extend the payment. My reason for doing so is, although the manager admits that the lode was never richer than at present, supposing it becomes poor such cases are only too frequent. I say it fearlessly that it is both cruel and unjust of Mr. Basset to demand the immediate payment of the money before it is too late. He has yet an opportunity of partly wiping out the stain that has sullied the fame of his family by giving the death blow under the present system to an industry which has been the chief means of raising him to his present position.—Perranporth, April 18.

JUSTICE.

LEVANT MINE, AND ITS MANAGEMENT.

SIR,—A report having appeared in your paper concerning the late account at Levant, held on March 27, which has given rise to a considerable amount of comment reflecting upon the mismanagement of the above mine, and on the aspersions cast upon the character of our late agent, Capt. Hy. Trezise, by an influential member of the committee; in order to clear the atmosphere or the question at issue I take upon myself to advance the following remarks.

When Levant Mine was resuscitated 10 years since, after being suspended through the action and conduct of one of the lords, the present body of adventurers accepted the lease with the proviso that no dues should be paid to the lords until the mine arrived at the position of paying costs. Capt. H. Boyns was in the first instance appointed our managing agent, and succeeded so far in developing the old bal as to place it in a very satisfactory condition. His indecency of character, due probably in part to an abnormal development of the bump of self-esteem, became a source of irritation to two members of the committee, who conspired his overthrow by issuing circulars to the out-adventurers, a considerable portion of whom through not residing in the neighbourhood were consequently unable to attend the meetings, and knew nothing personally of the veracity of the charges brought against Capt. H. Boyns, the heaviest indictment being that the mine would never in their opinion pay costs (in other words, lords' dues) unless Capt. H. Boyns was ejected from his position as managing agent. This brought about the resignation of Capt. H. Boyns, and a new agent became appointed, after advertising the vacancy, in the person of Capt. H. Trezise. I proposed Capt. Roach, whose credentials were, as might be expected, highly satisfactory, and who was, moreover, known to be an efficient dialler, as the most fit and proper person amongst the numerous candidates for the vacant office, which being seconded, Capt. Roach obtained the largest number of votes of the shareholders present. His election was, however, swamped by the number of proxies which the secretary, being also one of the lords of the mine, had procured, and which were now utilised for the election of Capt. H. Trezise.

In justice to Capt. H. Trezise, his straightforwardness of disposition and integrity of character has earned the esteem of those whose good will no honest man need be ashamed of; but this must not disguise the real motive for the displacement of Capt. H. Boyns, which soon became no longer a matter of doubt.

The committee having assumed the management of the mine, oscillate between masterly inactivity and temerity. A vast sum has been lavished in a vain show at surface, and thousands more have been squandered underground through their persistently refusing to have the mine effectually dialled by one skilled in the art, blunder has followed blunder, in corroboration of which I would refer to the latest—namely, that although we have been expecting for several weeks to have the submarine shaft, for which purpose 5000*l.* has

been expended, the committee have instructed their sub-agents to direct the boring machine operatives to retrace their steps 10 fms., and they are now driving in another direction, trusting to what chance may again do for or against the mine; yet the old bal ought to be, if it had fair play, the Dolcoath of the West, but like its great namesake it groans under the obnoxious influence of lordly influence, &c.—St. Just, April 18.

RICHARD B. SEARLE.

RELATION OF SHARE VALUE TO NOMINAL CAPITAL.

SIR,—Permit me through your columns to suggest to speculators the propriety of ascertaining not only the price of shares in those mining companies they are disposed to invest in, but also the number of shares into which the several mines are respectively divided, so as to become acquainted with the true selling price of each property. There are some mining undertakings selling at the present moment at the lowest quotations which have appeared for many years, and the character of these mines having been decided an advance in price is certain. Nevertheless, these properties appear to be overlooked.

CAUTION.

HOW TO WORK HEMATITE IRON.

SIR,—I am interested in certain property in South Devon in which traces of hematite iron have been observed, and on sinking a shaft a few feet deep some ore of excellent quality was discovered, but not in sufficient quantities to make it worth working; and, although I have no doubt a good lode exists there, I have been unable to find it. I shall be glad if some of your readers can supply me with any information with regard to the best method of searching, and also with reference to the nature of the soil or rock usually found adjacent to the iron lode.—Totnes, April 18.

SOUTH DEVON.

BEDFORD UNITED.

SIR,—Allow me a small space in your valuable *Journal* to make a few remarks on the present management of this mine. I am informed that it is in contemplation to sink a new shaft on the Bridge lode, and to lay down another line of rods, &c., probably at a cost of many hundreds of pounds. Judging from what I have recently read in more than one of the local papers, I believe that it would be most desirable that the directors of the company should employ and consult with some practical man, as to the necessity for the proposed shaft, and, if required, the best place to sink it, as it does happen sometimes that agents of small experience in dialling make mistakes that cost the shareholders many thousands of pounds. I have no hesitation in saying there is not a better sett in the district if well managed.—Gunnislake, April 18.

R. G.

TREVAUNANCE UNITED.

SIR,—I am glad to learn from last week's *Journal* that readers are to be supplied with some particulars respecting this mine, and think they ought to have appeared long ago. Why such reticence has prevailed I cannot understand, looking at the position of the property and the general circumstances of the company. These are most favourable and encouraging, notwithstanding the mine has not as yet entered the Dividend-List.

LOCAL OBSERVER.

SILVER HILL, AND ITS MANAGEMENT.

SIR,—The year 1881 saw the floating of many schemes and there are few amongst them calling more for investigation than the Silver Hill Company. This company came into existence early in 1881, was specially surveyed in April following by Mr. G. Henwood, commenced working a month or so thereafter, and supposed to be energetically continuing the path of industry still; but, alas! what a fallacy to us provincialists. The directors have had the pleasure of issuing one balance-sheet to its most fortunate shareholders, and now it would appear that the concern has gone to the wall, completely pumped out in capital. The directors took the usual lease of 21 years; but, as if to show what a mockery it was, this concern has run little more than as many months, and its working capital of about 20,000*l.* gone—echo answers, where? I presume the directors will say in the interests of legitimate mining. At the first glance it seems quite evident that wretchedly bad management must have had a great hand in this utter collapse; but I am also of opinion that the property must have been given a very fictitious value, and that by persons called mining authorities. In short, I have yet to learn if this property has returned a ton of any ore whatever since its birth, so longingly and patiently looked for by its supporters by faith of such bogus reports.

Nothing can be more injurious to legitimate mining as an industry than such a state of matters as I have shown should exist or be allowed to continue. Depend upon it, such disgraceful and deceitful practices will in time fail, or recoil on them who least deserve it, the working miner and his family. As "burnt barns dread the fire," such keen lessons will serve a lifetime to many; and their friends, who would otherwise place some capital this way, but certainly not with an industry so unjustly conducted. Is the property such that, with better management and more capital, some return may be confidently relied on in further development? If so, let the shareholders stick together, raise more capital, reduce expenditure as far as practicable, do away with London expenses, put the management into purely local hands of thorough knowledge, and see what that will do for it. Surely, after the development attained, plant and machinery there, the shareholders are not willing to stand by and possibly see some other company reap all the benefit of their expenditure and work when, I dare say, a little more capital would attain the object in view. Altogether, it must depend on the nature and value of the property, as it would certainly be rash to expend another penny on a rotten property. I trust the shareholders will express themselves freely on the subject.—April 17.

W. B. L.

THE GWENNAP DISTRICT.

SIR,—"Old Amateur" in a recent *Mining Journal* remarks upon certain mines in this district. More promising mines than those referred to—South Penstruthal and Cathedral—it would not be easy to name, although to the former might be added the adjoining sett, North Penstruthal, while Wheal Comfort should not be omitted as very promising ground. I believe there is no one district in the kingdom, Camborne excepted, that has from so small an area produced so much mineral as Gwennap. It is a famous one in the annals of Cornish mining. Treavean Mine is in Gwennap. The riches of Treavean Mine in the past are historical, nor has it now emerged again to hide itself in a corner. Its present owners cannot be accused of any neglect to recognise its merits, and in the interest of mining I wish it success again. For reworking purposes I prefer a shallow one, or one of moderate depth, to a very large and deep one—a mine in its youth and manhood rather than one in old age. I would not as a rule take a mine in its infancy. Let it be well over its opening years, generally expensive and non-productive. The four mines first mentioned are of the middle age, or early manhood period. The merits of South Penstruthal are, it would seem, little known outside its own body of shareholders, but I think they will have a prize at no distant date. As a mine it is not too deep, needs and has but one good pumping-engine to keep it well in work.

The Penstruthal Mine once gave large copper returns—so large that it is said to have had special samplings, and given over 60,000*l.* profit in a single year. This was prior to or about the year 1837. All its great returns came from above the 70 fm. level below the Adit. Below this the mine became for a time poor, but at the 130 the deep shaft came upon a bed of sulphur mundic, under which it was said copper would again be found richer, even than in the upper levels. The late Mr. John Little, then living at Redruth, was a shareholder in the last workings, and when the mine was stopped. I well remember his telling me not long before the present company was formed how he endeavoured to keep the old mine open, putting down on an account day on the table his cheque (for no small sum), as his proportion for a call proposed to sink below the mundic; but he was outvoted, the then adventurers being a local body, and not over wealthy. Mr. Little was a shrewd man, with good mining

knowledge, and would, had he lived, have been the first to have welcomed and supported the present company. The new South Penstruthal Company has been now at work two years. At first it had to surmount unforeseen difficulties (was there ever a mine that had not) to cut square two shafts from surface. This was done, and now the deep shaft is sinking by the side of the lode by boring machinery, and at its present depth finds continual droppers of quartz strongly spotted with yellow copper ore, all falling towards the lode, indicating that the copper will be found under the mundic as predicted. A correspondent from Redruth, and a shareholder as well, writes me only yesterday, and says—"All the favourable indications continue in sinking; branches containing copper, mundic, and spar abound in the shaft," and again, "6 fms. more will bring us to the 150, when we shall see the lode cut through. Should it contain copper worth but 20l. per fathom, we shall have a mine of great riches."—City, April 18.

NEW TERRAS TIN MINING COMPANY.

SIR,—In a copy of a report from the captains of this mine they speak very highly of the productive character of the stuff, and further state there are many in the district that can corroborate their testimony as to the richness of the property. I trust some of those who read the *Mining Journal* will favour us with their opinions, which, if favourable, will be a benefit to the company, by inducing others to take an interest in it. From various reports this property appears to have equally as good or better prospects than many which are more in favour with the public. I trust our Cornish friends will take this matter up.—Manchester, April 17.

NEW TERRAS.

RELATIVE VALUE OF MINE SHARES.

SIR,—I have, with doubtless many others interested in mining, been gratified to observe the daily advance in price of shares of certain mines in face of the depressed state of mining in general. Whether these rising prices are due to market operations or to the improved prospects of the mines it would, perhaps, be invidious on the part of an outsider to decide. With your permission, however, I desire to make a comparative estimate of the present market value of a few well-known dividend and progressive mines, with to all appearance equally good prospects. I shall first take lead mines as follows:—The present selling prices for the mines are—East Wheel Rose over 300,000l.; Old Shepherds 120,000l.; Tresavean 150,000l.; Roman Gravel 108,000l.; Green Hurth 51,200l.; Great Holway 60,000l.; Leadhills 60,000l.; Tankerville 27,500l.; Herodsfoot 36,000l.

It will be seen from the above that East Wheel Rose is selling at nearly three times more than Roman Gravel, six times more than Green Hurth, five times more than Great Holway, and five times more than Leadhills. While Tankerville and Herodsfoot, both of high standing in the past, and whose present prospects are of no mean order, are respectively selling at eleven times less in the one case and about one hundred times less in the other, Old Shepherds stands at a little over the price of Roman Gravel, twice that of Green Hurth, Great Holway, and Leadhills, about five times more than Tankerville, and forty times more than Herodsfoot.

If we now turn to tin mines we find East Wheel Rose selling at 50,000l. more than Dolcoath, 40,000l. more than East Pool, and at four times the price of West Kitty, and Old Shepherds at nearly double the price of the latter. It is, therefore, not unreasonable to assume that Roman Gravel, Green Hurth, &c., with Dolcoath, East Pool, and West Kitty, are relatively by far too low in price. Tresavean and Devon Friendship possess many points in common, and to an uninterested spectator, which I happen to be, the latter would appear to be approaching a dividend state in advance of the former; yet, curious to relate, the public value the former at 150,000l., and the latter at 12,000l.—Blairgowrie, April 17.

J. R.

EAST WHEEL ROSE, AND ITS FUTURE.

SIR,—“Old Miner” appears deeply exercised in his mind about some onslaught which seems to have been made upon what I venture to term the Mining Quadrilateral, of which East Wheel Rose is the chief member. I fear “Old Miner” is ungrateful to his best friends the “bears,” who have sold out so many shares that the “bulls” ask, and indeed obtain almost their own price for the shares. In fact the “bulls” are in clover, and with 9,000,000l. of dividends lying ready for extraction in one mine alone they must indeed be happy fellows. The intrinsic merits of mines must always send them higher and higher after each effort of the “bears.” The shareholders have been over the mines, they have seen all the riches, they quite understand all the ins and outs of mining. There is no room for any mistake.

“Investor” relates that in the old days no one thought anything of tin. I suppose he is as Mr. Lattimer would have said—“very young indeed,” for I believe when tin was 140l. per ton it was very much thought of, more so than it now is with a price of only 90l. per ton, and the market flooded with duty free foreign tin. I have hitherto considered that Cornishmen were the most shrewd, enterprising, and sagacious body of men in the kingdom. I fear I must give them up now, for they neglected for so many years to appreciate the El Dorado of the county—the mines of the Quadrilateral.

Cheltenham, April 17.

ANOTHER OLD MINER.

THE HOLMBUSH AND REDMOOR DISTRICT.

SIR,—A very valuable discovery is reported this afternoon in Holmbush Mine. A splendid lode of copper and mundic, which is areal, has been intersected at the 110 fm. level, and supposed to be a side lode of the Flapjack lode, and believed to promise a new discovery in depth. More next week.

JOHN BUCKINGHAM, AM.

Callington, April 19.

THE CAMBORNE DISTRICT—WHEEL CAMBORNE.

SIR,—Whilst the discussion between Mr. Basset and the Dolcoath adventurers has resulted in a new lease being arranged by the payment of 25,000l. to the lessor, a matter of no less importance has been settled. Sir Vyell Vivian has granted at a 1-20th royalty the Old Wheel Gons and the land under Camborne Town. To obtain the land for mining purposes has for many years been considered impossible, having been tried for by many of our leading miners without success. The working of this mine will be a great boon to the district, and if fairly carried out cannot fail to be a great success, since the East Pool lodes, after traversing Carn Brea, Tincroft, Cook's Kitchen, and Dolcoath (the best mines in the county), pass through Wheel Camborne, which is dry to the 180 fathom level, and at Tyndal's there is now a course of ore at the 40 under adit. This mine must be drained by Dolcoath, which is now 400 fathoms deep.

April 19.

JAMES EVANS.

“Mr. George Seymour, of the firm of Messrs. Bainbridge, Seymour, and Rathbone, 2, Great George-street, Westminster, purposes leaving for the United States in the course of the ensuing fortnight, and will be glad to undertake any mining inspections or reports during his stay in North America.”—ADVT.

THE EXPLORING OF MINES AND SAVING OF LIFE AFTER EXPLOSIONS.—The attention of the owners and managers of mines has been drawn by the Government Inspector of Mines to the value of Fleuss' apparatus for the saving of life after explosions, and through the courtesy of Mr. Wardell we have been favoured with a copy. It is suggested that in mining districts there should be stations for the storing of the apparatus in sufficient numbers and maintained in readiness for immediate use, and where the instruction of the men in the surrounding mines should be systematically carried out. A rescuing party could thus be speedily on the spot after the occurrence of an accident in a particular district in which a station had been established. The apparatus had been most successful in connection with the explosion at Seaham Colliery in 1880, and in 1882 at Killingworth Colliery, where there had been an accident. Mr. Hedley, who personally tested the apparatus at the Seaham Colliery, suggests that certain mines in each district should be supplied with six sets of apparatus and lamps on the Fleuss' principle, together with the necessary appliances for making and compressing the gas required. The Royal Commissioners on Accidents in Mines brought the matter

under the notice of the Home Secretary, and appended a description of the apparatus and lamp given by the inventors. This has been several times published in the *Mining Journal*.

REPORT FROM CORNWALL.

April 19.—It is very curious that the Dolcoath question should have been solved in the way it has been by the adoption of both the proposals in part, which we pointed out were most in favour. The plan of making a call for the 25,000l. had fallen out of the running, and opinions were pretty evenly divided—now swaying to this side and now to that—between the issue of new shares and the making of a loan. A fortnight ago the feeling was evidently in favour of new shares; a week ago it went for a loan; this week by a kind of amiable neutrality both methods were approved: 204 new shares are to be issued, the manner and time being left in the hands of the committee, and the balance required is to be borrowed, half the dividends being forfeit until the debt is paid. As we could see no objection either to the issue of new shares, equitably arranged, or to the raising of a loan on reasonable terms, we certainly can see none to the adopted combination, and are inclined strongly to believe, all things considered, that the very best way out of the difficulty has been adopted. With regard to the disposal of the shares, however, we still hold that it would have been better if it could possibly have been arranged to offer them *pro rata* to the existing shareholders (surely half a dozen business men could have had no difficulty in settling a proportionate price, allowing for the increase); but if that cannot be done, certainly a sale by auction is the fairest mode, only it would be inadvisable to go to the sale just at once. Let confidence be restored, as far as it may be, first; but there really seems no reason why the plan suggested by Mr. Rogers should not be adopted, and the shares sold after the business of the next account. However, it is quite open to the committee to adopt this course, and it is not at all unlikely that they may. The proposal to lend the money by Messrs. Williams and Grylls at 4 per cent. is one which must commend itself to all concerned. Better terms, indeed, could not have been looked for. Let us hope, then, that we now at length know the Dolcoath worst. On the other hand, it is quite as strongly to be hoped that we have not heard the last. It is something to have come to a general agreement that the Legislature must interfere in these matters, and to have resolved to bring the whole question under the notice of Parliament. But this must be done in a practical way. It is of no use to make a complaint unless there is the determination also to propose a remedy. Concerted and well-considered action is, therefore, indispensable, and here there is still some lagging.

The case of the mining interest, especially as regards the payment of dues otherwise than on profits, and the establishment of “mining right,” was very well, while none too forcibly put, in a lecture by Mr. Laurence, delivered the other day at Redruth, and which deserves a more detailed reference than it has hitherto received. Mr. Laurence, *inter alia*, remarked:—If, taking into account the other charges, mine dues are to be justified at all, it seems to me they can only be justified when they are payable out of profits, or after establishment charges have been deducted. Failing such an arrangement as this, what do we see? All risk, all labour, all sacrifice of money on the part of the shareholders, cumulative gains, perfect security on the part of the lords. It may be asked how a mine which is not making profits is to be dealt with? In that case let a minimum rental be paid. Such a course ought to recommend itself because of the anomaly, the hardship it would remove—paying dues in respect of ore that can only be raised by calls. The other alternative of deducting certain establishment charges from the receipts for the tin sold before paying dues will doubtless commend itself to many. But I question whether the proposal will meet with general support as far as regards non-dividend mines, where the shareholders reap no advantage. No profit, no dues—but a minimum rental if you like—is an equitable basis for working mines upon, and certainly signs are not wanting that public opinion is growing in its favour. How are these remedies to be brought about? The first impulse of anyone would be to appeal to the lords for their favourable consideration of the points raised. Moral suasion is capable of doing much good. It may—I do not say it will—do good for you and your mines. You at least have not a weak case to present to the lords. It ought not to be an insuperable task to convince them that the more permanent you can make the mines the better it will be for them in all respects. Their other property will acquire stability in proportion as the mines are made permanent concerns. Besides the actual payments referred to, from which the foreigner is exempt, you have a further argument in that your mines are deeper, and, therefore, more expensive. In addition to this the tin is of lower quality. These are matters which should not be disregarded. The tin that is being returned in Cornwall is a diminishing quantity. The official figures show it has fallen from 13,341 tons in 1877 to 11,788 tons in 1881. The greater need, therefore, of a recasting of the land system, so that other deposits than those which have been operated upon should be prosecuted. But should moral suasion fail then, in the words of Mr. Gladstone, but with a different meaning, “the resources of civilisation are not yet exhausted.” There is a Parliament to which recourse can be had. You will have observed that that Parliament has acknowledged the grievances of the farmers. Is it to be supposed it will ignore the grievances of the miners if they are properly represented? Tenant-right has been claimed on behalf of the agriculturists. What better, what more genuine tenant-right can be set up than by mine adventurers who sink shafts hundreds of fathoms, who drive cross-cuts, who lay open a mine, and leave reserves behind them? These are unexhausted improvements as literally as the crops a farmer may have in his fields when his lease expires. As such could it not with equal force be argued that the miners, too, should be compensated? I will not say that compensation should take the form of a direct payment save when an existing company might wish to sell its interest to another. But in the case of the owner of the soil, so far from increased dues or a premium being demanded to renew a lease, do not the unexhausted improvements establish for the shareholders a strong moral concurrent right in the sett that should be recognised—perhaps made legal—in some instances by even a reduction of dues as depth is attained? For it should be remembered that a mining company pays at the outset for the ground it breaks more than its superficial value—that is, its value apart from the expending of money on it by others than the lords for mining, and without which it would be worthless. “No man,” as Mill said, “made the land;” and if the lords should be disposed to point to the probability of their predecessors in the ownership of the estates having acquired their properties in a manner which is above suspicion, it might be expected they should also give due effect to a tradition as old as the majority of the estates—a tradition sanctioned and authorised by the Statutory Parliament of 1588, when Sir Walter Raleigh was Lord Warden, which declared “that the tenant by courtesy—the tenant in dower or for years in wastrell ought to be, according to custom, allowed to work; and if the tinner working in the same way toll-tin to the lord that then the same be adjudged a lawful tinwork, and assured to the tinner for ever.”

We are glad to see the Trevithick Memorial at length making substantial headway. There certainly has been no memorial movement for many a long year which merits so strongly the support of practical men of all classes and grades, and which appeals so strongly to the sympathies of Cornishmen, without distinction of creed or party. There ought to be little difficulty not only in worthily honoring the great engineer, but in laying the foundation of abundant future usefulness for many a generation to come.

A very important case has been heard this week in the Queen's Bench Division affecting the liability of working miners to the provisions of the Metalliferous Mines Acts. Mr. Frecheville, the Inspector, appealed against a decision of the Camborne Bench, commented upon at the time in this column. The respondents were not represented by counsel.—Mr. Mackey, on behalf of the appellant, stated that the respondents were working miners employed at Dolcoath Mine, and on Nov. 14 were summoned before the justices of the East Penwith Petty Sessional Division, sitting at Camborne, for having, on Oct. 9, previously contravened the 11th sub-section of the Metalliferous Mines Act, 1872, by riding in a skip without having

sufficient cover overhead when being raised in a working shaft of the mine. The sub-section in question provided that “sufficient cover overhead shall be used when lowering or raising persons in every working shaft, except where it is worked by a windlass, or where the person is employed about the pump or some work of repair in the shaft, or where a written exemption is given by the Inspector of the district.” There were two shafts at Dolcoath, one of which was provided with a man-engine, and that was the only proper way for miners to be raised or lowered. The respondents were at the bottom of the other shaft, and it was asserted that they improperly used a skip for the purpose of reaching the surface. The skip ought only to have been used to raise ore, it having no cover overhead at all. The justices refused to convict, holding that the sub-section applied to agents and owners only. He submitted, however, that the language of the Act made it clear that the sub-section applied to working miners as well.—Mr. Justice Field observed, in delivering judgment, that the question was one of an important character and of very general application. The Act of Parliament contained carefully-considered regulations for the safety of persons in and about the mine, including, he should have imagined, as a matter of fact, the working miners themselves.—Mr. Justice Mathew concurring, the case was ordered to be sent back to the magistrates for the purpose of being re-heard.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

April 19.—Pig-iron makers are unable to report that the Quarterly Meetings have brought out any large number of new contracts. The Spring Vale Company, Bilston, however, state that they have done very fairly. Their out-turn is now over 1000 tons weekly, and stocks are not much increasing. Prices generally are easy, at 65s. for all-mines, 50s. to 45s. for part mines, and 40s. to 38s. 9d. for common pigs. Hematites are 62s. 6d. to 65s. nominal. Manufactured iron is tame, though sheets show somewhat less stagnation this week. Unmarked bars range from 7l. to 6l., and hoops from 6l. 10s. to 7l.

A meeting of the coal trade and the miners' delegates was held this afternoon in Birmingham, Mr. Fisher Smith in the chair. The masters enlarged on the necessity for a reduction in price and wages, but the men strongly opposed. Ultimately it was resolved to drop furnace coal 1s. per ton on May 1, making Earl Dudley's quotation 10s. Thick coal wages will fall 4d. per stint, and Thin Coal wages 2d. The Ironmasters Association discussed the wire gauge question to-day. They resolved that any alteration in the existing gauge was as regards the iron trade undesirable.

The arbitrators under the Mines Drainage Acts have given notice of their intention to make a draft mines drainage award for the Tipton district. The rate required is 3d. per ton on fire-clay and limestone, and 9d. per ton on ironstone, coal, and slack. Appeals will be heard in Wolverhampton on May 5.

The Committee of the Mining Accident Fund had their quarterly meeting in Wolverhampton, on Wednesday, and made grants, on nine special applications, of 42l. to the widows and orphans of colliers who had been killed while at work during the preceding three months. It was decided to issue a further appeal for funds.

The Chairman of the Mill and Forge Wages Board, Mr. B. Hingley, has issued a circular to the ironmasters calling attention to the dissatisfaction of the subscribing members towards those firms who adopt the decisions of the Board—or whose wages scale are regulated thereby—but who refuse to subscribe to its support. The board, says Mr. Hingley, is now in the eighth year of its existence, and has been tried in various ways. The firms who do not subscribe can no longer say, therefore, that they wish to see how it works before making up their minds, “and the time has certainly arrived when the matter should be fairly dealt with by all parties interested.”

At the beginning of the week the underhand puddlers employed at Earl Granville's Ironworks, Hanley, struck work against the 5 per cent. reduction in wages decreed as the result of the investigation of the ironmasters' books in South Staffordshire, and which governs the north as well as the south of the county. The strike only lasted a day or two, however, for the men had really no just ground of complaint.

TRADE OF THE TYNE AND WEAR.

April 18.—All branches of the Coal and Coke Trades here continue, on the whole, fairly employed; there is, indeed, a little restriction in some cases, pits being laid off one or two days owing to a deficiency in tonnage. The Baltic trade is expected to be opened out generally shortly, and this gives considerable spirit to the steam coal trade present and prospective. Orders at a price based on last season's price can be had in abundance, but coalowners naturally stand out for better rates, and there is some discord between merchants and colliery owners which may probably lead to the discomfort of some of these speculators over the season. Steam small coals continue in full demand, and it is an encouraging feature that the demand for this kind of coal both at home and abroad continues to increase year by year. This certainly represents a substantial advance in the value of the produce of the Northumberland collieries. In Durham the collieries are, on the whole, fully employed. Gas coals are still a fair trade, although, of course, there is not the pressure for the coal there was experienced in the winter. The Wallsend house coals are in fair demand for the coast and the London and other markets.

It appears that rapid progress is making with the iron industry at Bilbao, and, of course, a considerable quantity of coal is required by this industry. This port is, therefore, a good outlet for British coal. British steamers have brought enormous quantities of hematite ore from Bilbao during the past few years, and they will, of course, take coals outwards at a low freight, so that a considerable trade in coal may now be expected in that district. And the coalmasters in this district expect to get a share in this business, as a large number of steamers connected with these rivers are constantly engaged in bringing ore from Bilbao to the Tyne, Wear, and Tees. Great improvements and extensions have been in progress some time at the Castle Eden Colliery, near Eden. Improved machinery has been erected at the surface, and the underground roads have also been greatly improved during the past 12 months. The object of these improvements was to prepare for the working of a field of coal known to exist, but which was abandoned 35 years ago when the colliery was worked by Messrs. Richardson. This coal, which lies under the Hataim estate, has now been fully proved, and it will be worked at once extensively. A contract has been entered into for the erection of 300 cottages for the accommodation of extra workmen. The present owners of this famous old colliery—Messrs. Pyman, of Hartlepool—have only had possession of it for a short period, but they have been very successful in extending and improving it.

A general meeting of the members of the Northern Institute of Mining and Mechanical Engineers' Institute was held in the Wood Memorial Hall, Newcastle, on Saturday, under the presidency of Mr. George B. Forster. Mr. E. B. Martin read his paper on “Explosions of Boilers and other Vessels,” of which an abstract appeared in last week's *Mining Journal*. A series of models and diagrams of exploded boilers were exhibited to illustrate the paper and explain the views of the author. The papers of Mr. W. S. Gresley on “Two Systems of Working the Main Coal at Morra, in Leicestershire,” and of Prof. Aldis on “Internal Stress on Cylindrical and Spherical Dams,” were also read. Some remarks were made on these papers, but the full discussion of them was postponed until future meetings.

A meeting of the Newcastle Association of Foremen Engineers and Draughtsmen was held on Saturday night in the same building, and Mr. Martin explained to that society his diagrams, &c., illustrative of his paper on Boiler Explosions.

A paper was read on the very interesting subject of the Tees Salt Beds, at a meeting of the Cleveland Institute of Engineers, held on Monday in the Hall of the Literary and Philosophical Society, Middlesborough, by Mr. Thos. H. Bell. Mr. Bell, in opening, dwelt at some length on the peculiarities of the mineral salt and its mode of deposition, pointing out that it occurred in all the water on the face of the globe, and also in nearly every geological formation; that in Europe it is chiefly confined to the rocks lying between the coal measures and the lias which was formerly called the New Red Sandstone, but which now were divided into permian or dyas and

HOLLOWAY'S PILLS—IMPURITIES OF THE BLOOD.—To ensure health it is absolutely necessary that the fluids and solids of the human body should be kept free from impurities which are continual sources of disease. Admission into the system by Improving the whole system, surroundings, or disordered state. The surest way to expel all such impurities is to take Holloway's pills, which have the power of cleansing the blood from all noxious matters, and the same time removing any morbid changes which their presence may have already produced in any organ. Holloway's pills expel all humours which taint or impoverish the blood, which they purify and invigorate, giving tone to the nerves. They are applicable to all ails—youth or old, robust or delicate.

ON THE COVENANTS OF MINING LEASES—No. II.
BY CHARLES PARKIN.

4.—COVENANTS TO BE OBSERVED BY LESSEE.

1.—Dress all ores, and preserve those of inferior quality.—Lessor must dress, clean, and render fit for market all ores raised, and preserve also the ores of inferior quality for such purposes as the same may be applied.

2.—To work all discovered minerals, and in default lessor may work same and use lessee's appliances gratis.—To work within one month of notice given by lessor in writing, any seam, vein, or lode which shall be discovered and have been unworked for three months prior to notice, and in case lessee shall not work same lessor shall be at liberty to work same himself or demise to anyone else, and shall use the levels, shafts, engines, tubs, ropes, and other material belonging to the lessee gratis.

3.—Not mix minerals with those from other lands without lessor's consent.—Shall not mix minerals raised in the premises with those from other lands without the consent of lessor.

4.—To work without intermission, and keep workings free from water.—To work within the limits in a proper and effectual manner with a sufficient number of skilled miners and workmen without intermission, and to employ necessary numbers of horses, cattle, carts, engines, machinery, utensils, and other requisites for working the mines in such workmanlike manner as will tend to the mutual benefit of the parties. (N.B.—Sometimes it is covenanted that not less than a specified number of miners be employed.) Also to keep the workings at all times drained free from water down to the lowest levels or workings.

5.—To keep open all workings in good repair during term, also machinery and buildings, and give up in same state at end of term to lessor.—To keep open and in repair during the term in workmanlike manner, and with good material, all pits, shafts, levels, and workings of all descriptions now or hereafter opened or worked in; and also all engines, buildings, and other appliances, and shall at the end of the term deliver up all such levels, pits, shafts, &c., in a good substantial condition, without filling up or otherwise rendering them in any way useless.

6.—To work in skilful manner, and discover minerals, and penalty in default.—To work to the best of their judgment and skill, and manage, get and raise the demised minerals according to the most approved method of working in the county; and to bore, sink, and execute all such works as may be requisite or deemed likely to tend to new discoveries of mineral; and in case by reason of any unskilfulness or careless management by or on the part of the lessees in or about the working of the mines, or that any part of them shall be lost or destroyed, or become incapable of being worked or gotten, then the lessee shall and will, on being requested so to do by the lessor, pay the lessor the value of all such mines and minerals as shall be lost, &c., as aforesaid, in same or like manner as if the said mines and minerals had been actually gotten by the lessees, such value to be ascertained in case of disagreement by arbitration.

7.—Fill in all workings, leaving land in good state as before, or pay fee simple value.—Shall when required by lessor at end of term fill up and level all, every or any of such pits, shafts, levels, &c., and restore the land into as good a state as it now is. In default thereof, within six calendar months after notice pay lessor the fee simple value of it, ascertained in case of disagreement by arbitration, the said land remaining nevertheless the property of the lessor, but to fill in no pits, &c., without written permission of lessor.

8.—Erect and keep in repair fences, gates, &c.—To erect and keep in repair during the term, and leave at the end thereof to the satisfaction of lessor fences round all workings whatsoever necessary to be kept open (in Cleveland with good substantial posts and double rails, or in Cornwall stone fences round every pit, quarry, or open place not less than 6 ft. high, and to solar the shafts with stone 12 ft. below surface); to put and keep in repair proper gates, &c., to protect lessor from trespass; to erect at once and keep in repair all stone boundary post which shall be required in writing by lessor.

9.—To indemnify lessor against claims for damage to adjoining lands, cattle, &c.—To indemnify lessor from all claims by reason of any injury or interference with any adjoining lands or cattle, &c., caused by the working of the mines, or with any part of the demised lands or cattle or goods thereon, and to make full compensation for all such damages.

10.—To prevent trespass, and not allow dogs on the premises.—Not to allow dogs of any description on the premises; also to use all reasonable efforts to prevent workmen in their employ from trespassing or taking game; and to discharge from such employ all persons convicted of so doing.

11.—Lessor may enter mines and premises at all reasonable times to examine and make plans, lessee assisting him.—Lessor to have free access to all reasonable times, and may enter the mines and premises to survey, inspect, or make plans of same; and to see whether they are in good order and repair, and are worked and managed in a proper and skilful manner according to the true meaning of these presents, and lessee shall assist lessor or his agents in so doing by means of his agents, workmen, engines, and other appliances free of charge.

12.—Weigh machines to be erected, and lessor have access to same.—Lessee shall erect and keep in correct and good repair one or more good weighing machines, to ascertain the quantities of mineral worked from or carried through or over the premises, lessor to have free access of same to examine or adjust when he may think proper.

Give monthly statement of weights if required; no mineral to be taken away unweighed.—Lessee to regularly weigh all minerals as aforesaid either alone or with person appointed by lessor, and render lessor if required a monthly statement of all such weights, and not to allow any minerals to be carried from or over the premises without being so weighed.

13.—Keep plans of mine, allow lessor to inspect or give him copy, &c.—The lessee shall at all times during the term keep a true and particular map and plan of all the workings, so as to show fully the true state and conditions of such workings, kept in some convenient place on the premises, at all times open to the inspection of lessor, and once a year (or when required) to deliver to lessor a correct and fair copy of the same made up to date, or in other cases allow lessor to copy same.

14.—Accounts.—Lessee shall in some convenient place on the premises keep fair and legible books of accounts, with true entries of the weight and quantity of all minerals as aforesaid. Those carried from adjoining lands over the premises to be shown separately and on the days upon which the several rents and royalties shall become payable, regularly cast up the several accounts, and state the totals thereof, and at their own expense make out and deliver to lessor a full and correct statement of such accounts, and shall at all times when required produce and show the lessor any such books and accounts, and all other books, papers, and accounts whatsoever as may relate to the mines and premises, and permit him to inspect, peruse, and take copies or extracts of the same as he may require or think necessary. To cause true and correct accounts to be kept on the premises (1) of all minerals raised; (2) of all sales thereof; (3) price realised for same; (4) and the cost of prosecuting the workings. Also list of all shareholders in the mine specifying their interests therein, and their names, addresses, and occupation in full, and to allow lessor to examine, copy, or take extracts of the same at any time. To give up at the end of term all such lists, books, papers, registers, plans, and sections to lessor in good condition as may relate to the past working of the mines.

15.—Notice of sale and payment of dues before removal (metaliferous ores).—To sell all ores by public competition, and to give lessor six (sometimes ten) days' notice of removal, and pay royalty dues within 60 days after sale and before removal, and to give a return of the prices for which the same has been sold, with name and address of purchaser immediately after the sale. [This covenant applies principally to tin, lead, and other metaliferous ores.]

16.—Purchase of timber.—In cases where lessor has timber for sale on the premises this clause is sometimes added:—To purchase of lessor only all timber necessary for the mines and premises so long as he shall be willing to supply same at the general market price of the neighbourhood.

17.—Not to damage growing timber or premises.—Not to do or suffer to be done any damage or waste to the said premises, or to the woods, timber, or saplings, and that all timber, wood, or saplings shall belong to lessor who shall be paid for same as growing timber.

18.—Lessor may use machinery, &c., at any time.—To permit lessor at any time during term to use engines and all appliances for any reasonable purpose, lessor making lessee reasonable compensation for such use.

19.—Not to work other mine in connection with premises without lessor's sanction.—Not to work any other mine, royalty, or sett in connection or attached to the premises without the licence of the lessor in writing.

20.—Guarantee for due performance of covenants.—That 150*l.* shall be held by lessor as guarantee for the due performance of the covenants, and in case of breach such sum to belong to lessor.

21.—Samples of ore.—To deliver if required or to permit lessor to take samples of any minerals at all times.

22.—Not to assign lease or underlet, &c.—Lessees shall not at any time during the term assign, grant over, or underlet the demised premises or any part of them, or any of the liberties or powers hereby granted to any person whatsoever without the licence and consent of the lessor in writing for that purpose first having been obtained.

23.—Distrain for rent, &c.—Agreed, that should the whole or any part of the various rents and royalties be unpaid for 21 days after due and demanded, it shall be lawful for the lessor to stop, hinder, and obstruct at the mines all operations, or the carrying away of any minerals from, through, or over the premises; and to seize and detain on all minerals raised, and on all machinery, &c., horses and other effects, and to sell and dispose of the same, and out of the proceeds of such sale to retain and take all such arrears due and costs of distress and sale, the overplus, if any, to be handed over to lessee.

24.—Lessor may re-enter for any of following causes.—If (1) the said rents, royalties, or any sums herein made payable shall happen to be unpaid in whole or in part for the space of 60 days next after any of days appointed for payment and lawfully demanded on the expiration of those days, and shall not be paid, and no sufficient distress can be found or gotten on the premises to answer such arrears; or if (2) the lessees refuse or neglect to pay the rates and taxes; or if (3) they shall not work the said mines and minerals in manner as aforesaid; or (4) shall demise, assign, over or underlet the premises or any part thereof for any part of the term without the consent of the lessor in writing; or shall (5) omit wilfully to make full and correct accounts, and so to be furnished to lessor, of all minerals raised or carried over the premises; or if (6) lessee shall become bankrupt or insolvent. And from thenceforth for all or any of the above causes it shall be lawful for the said lessor to re-enter and repossess the premises as in his first and former estate, anything to the contrary, notwithstanding.

25.—Proviso as to any action in law.—If any suit or proceeding be instituted by the lessor against any shareholder interested in the premises, no objection shall be made that the persons so sued are not expressly named in the licence of lease, and any decree or order may in such proceedings to have the same effect as if no other person had been a necessary or proper party to the same.

26.—Not to remove off the premises.—Not to carry off the premises any machinery or other materials without substituting others of greater value, or payment made to lessor in compensation, and until all rents, &c. due shall be paid.

5.—ARBITRATION.

Provision for appointment of arbitrators in case of dispute as to amount of compensation in any matter, or as to the true meaning of any of the covenants and conditions herein contained. Each party to appoint an arbitrator within one calendar month. If either party refuses to appoint one the other party may appoint both. The two arbitrators before proceeding and within two weeks to appoint their umpire, whose award shall be final and conclusive on all parties concerned. All parties to submit to be examined on oath by arbitrators for discovery of any facts, and to produce all books, accounts, papers, &c., in their custody relating to matter in dispute, agreed that no suit at law or in equity shall be instituted by either party before the defendant shall have refused to refer the matter to arbitration, or unless the time limited for making the award has expired without any award being made. Nor shall any suit be commenced by either parties against the arbitrators or their umpire in any matters referred to them. And it is further agreed that the award of arbitrators or umpire may be made a rule of the Court of Queen's Bench at the option of either party, and that the amount of any damages or compensation fixed by them shall be deemed so much rent reserved under the lease or licence.

THE MITCHELL LIBRARY.—The annual report of the librarian—Mr. F. T. Barrett—to the Glasgow Town Council, which has just been issued, gives abundant evidence of satisfactory progress, and shows that great credit is due to all connected with the manage-

ment. During the year 1929 volumes have been added, and as regards number of volumes there are now but six larger libraries in Scotland—the Advocates' and Signet Libraries in Edinburgh, and the libraries of the Universities of Edinburgh, Glasgow, Aberdeen, and St. Andrews. The reading room is supplied with current newspaper and scientific literature to an extent which is probably unequalled by any other library in the kingdom.

ANTHRACITE COAL.

Now this special description of fuel is attracting so much attention, and its superior qualities are being more fully appreciated both for domestic and steam purposes, it may interest those of our readers who are associated with its production and use to peruse the following extract taken from the official report just issued of tests made by Mr. D. R. Clark, C.E., for the committee of the Smoke Abatement Society of London, showing the amount of water evaporated per pound of coal:—

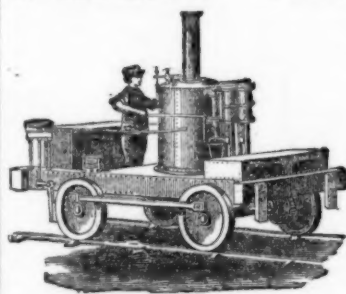
	Actual lbs.	From 212° lbs.
1—Four-foot Vein, Ystradgunlais	8.13	9.59
2—White Vein, Ystradgunlais	6.99	8.25
3—Nine-foot Vein (Evans and Bevan)	8.34	9.84
4—Peacock Vein, Gwaun-Cae-Gurwen	8.87	10.57
5—Black Vein, Ystradgunlais	8.18	9.65
6—Big Vein, Gwaun-Cae-Gurwen	10.89	13.01
7—Brass Vein, Ystradgunlais	11.89	14.23
8—Four-foot Vein (Evans and Bevan)	6.84	8.11
9—Four-foot Vein (Evans and Bevan)	6.89	8.17
10—Big Vein, Amman Valley	7.35	8.72
11—Glynmoch	9.25	10.96
12—Nine-foot Vein, Maesymarchog	8.20	9.76
13—Timber Vein, Swansea Valley	8.24	9.85
14—Red Vein, Amman Valley	7.90	9.45
15—Cawdor Colliery	8.42	9.98
16—Stanlyd Vein	9.94	11.84
17—Nine-foot Vein, Gwendreath Valley	8.37	9.97
18—Four-foot Vein, Gwendreath Valley	7.57	9.01

It will, therefore, be seen that the Ystradgunlais anthracite from the Ynisedwyn coal field ranked first. The commendable position this fuel has attained at the above trials, and the highly satisfactory result arrived at, should be the means of enhancing its value, as the tests show that, with proper attention, it can be made applicable, not only for domestic purposes, but for all descriptions of steam purposes, at a considerable saving to the consumers, so that, as a matter of fact, there is no reason why it should not command the same price as even the ordinary, if not the best, Welsh steam coal; and further, it is surprising that consumers are not more alive to their own interest by availing themselves of the saving effected by using this coal, which undoubtedly, in the early future will be the leading article of consumption of the day.

The report then goes on to say—Anthracite as a fuel appears, from the general results of testing, to be as efficient as Wallsend coal in open grates, whilst it is decidedly more efficient in close stoves. It is also remarkably more efficient in grates and stoves in which a supply of warm fresh air is provided and delivered into the room. Such a function does not appear to be fulfilled economically with Wallsend coal as fuel. The anthracites were in general rough of fracture and friable. The most efficient of them for the ratio of the evaporated water to the fuel according to column 16 of the table was No. 7, the Brass Vein anthracite from Ystradgunlais, by which 14.23 lbs. of water was evaporated per pound of fuel from, and at 212° F. At the end of the eight hours' trial there was but little clinker and ash, and the clinker did not adhere to the fire-bars. The anthracite proved, in fact, to be one of the best of all the samples that were tested in combining evaporative efficiency with maintenance of pressure and ease of stoking. Nos. 8 and 10, anthracites from the Four-foot vein of Evans and Bevan, proved to be the poorest of all the anthracites that were tested; the steam pressure could not be maintained as the grate was encumbered with ash and clinker, which required to be frequently sliced, although it parted without difficulty from the bars. The Cawdor anthracite, No. 15, swelled to a small extent in the furnace, an indication, probably, of a slightly bituminous nature, though it was entirely smokeless. The Dynant anthracite, No. 16, was hard, and it broke with a clean fracture. It burnt brightly and evenly, with a strong heat. The damper was fixed at half open, and it remained in this position during the test. The clinker was easily sliced off. The Trimsaran samples, Nos. 17 and 18 from the Nine-foot vein and the Four-foot vein of the Gwendreath Valley, behaved differently. No. 17 yielded more heat and evaporated more water than No. 18, but it burned less freely.

This proves that anthracite coal is taking a high position as a fuel for all purposes, apart from the great advantages of its entire freedom from smoke, and its economy in use and price.

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9 to 27-horse power. Can be made to suit any gauge from about 2 ft. upwards, and are especially adapted for steep inclines and quick curves. They are strong and simple in construction, and geared to draw very heavy weights in proportion to their power. A large number are successfully working at QUARRIES, GASWORKS, RAILWAY SIDINGS, &c.

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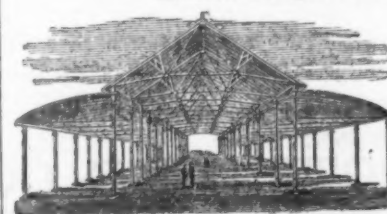
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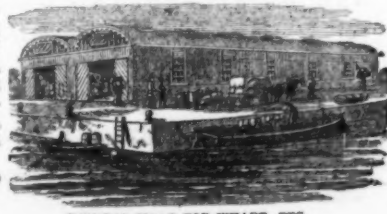
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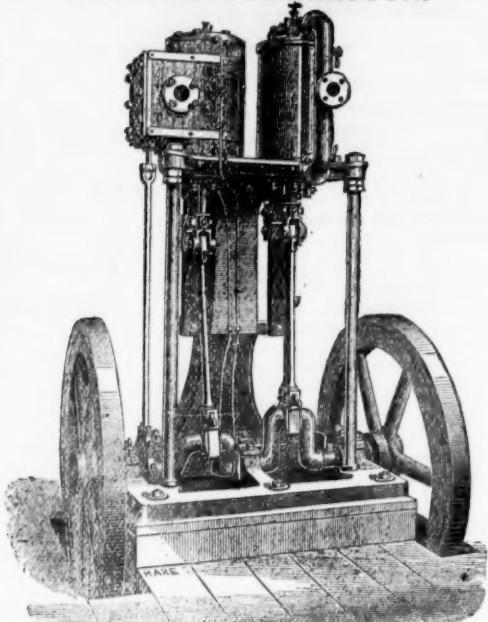
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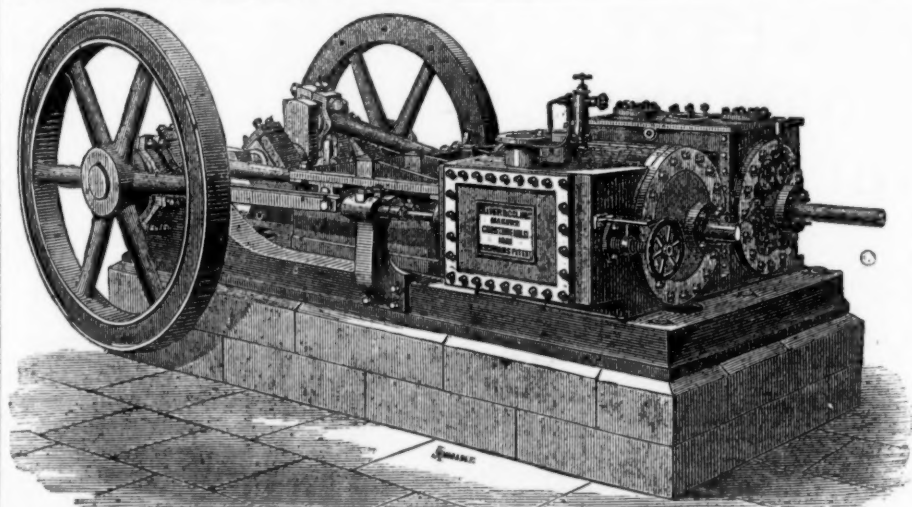
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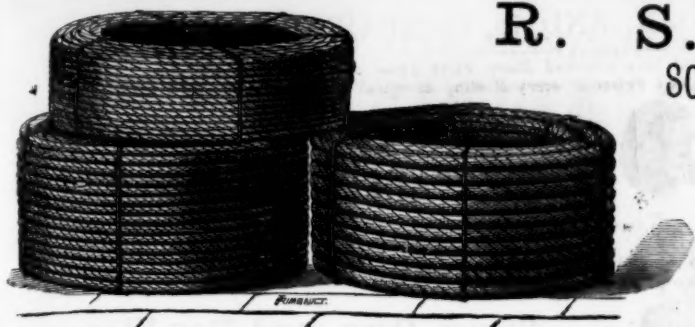
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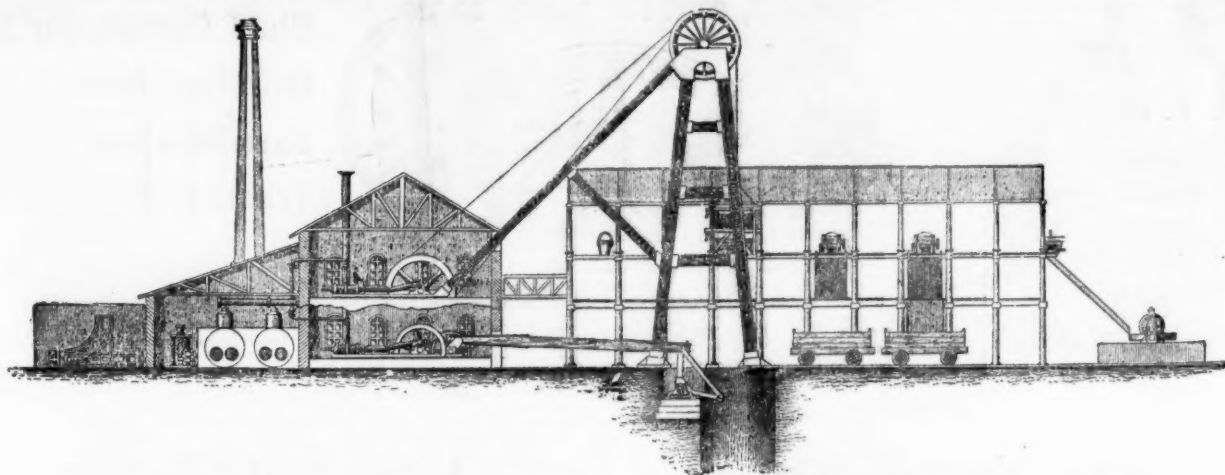
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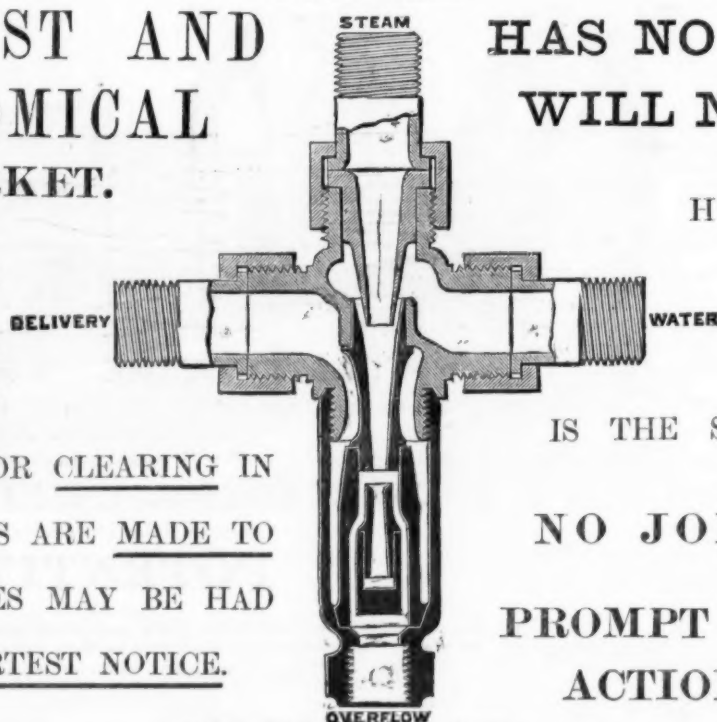
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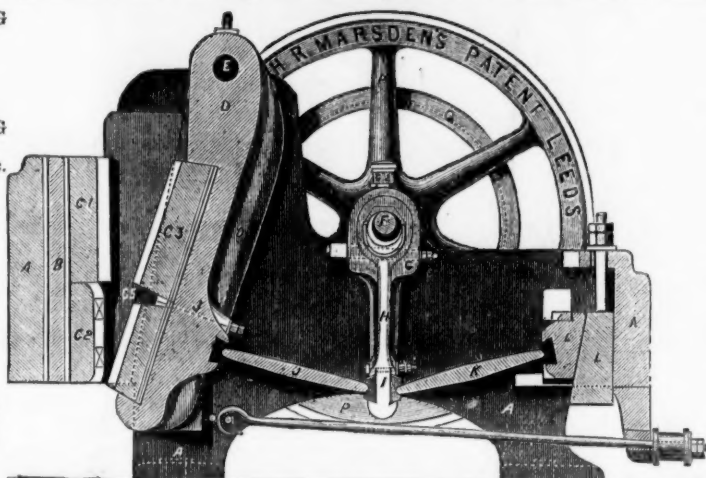
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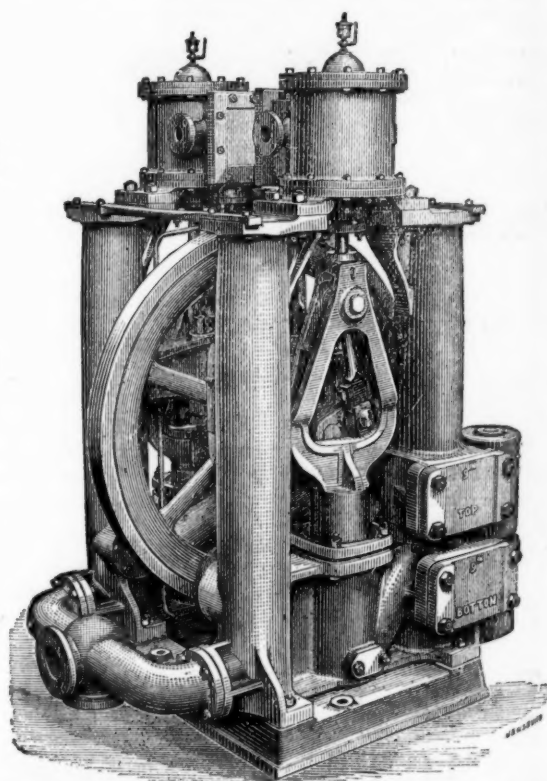
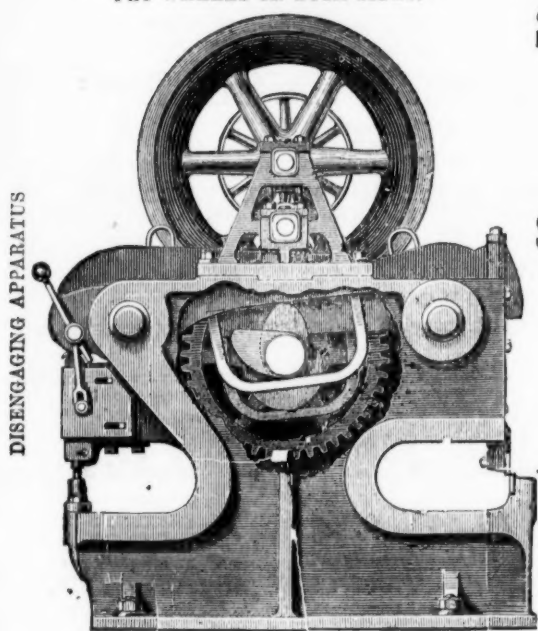
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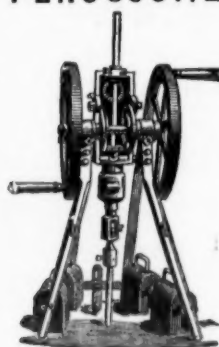
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